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Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*
— *with (an) indication(s) in relation to deposited biological material furnished under Rule 13bis separately from the description*
— *with sequence listing part of description published separately in electronic form and available upon request from the International Bureau*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 02/02587 A1

(54) Title: B7-LIKE POLYNUCLEOTIDES, POLYPEPTIDES, AND ANTIBODIES

(57) Abstract: The present invention relates to novel human B7-like polypeptides and isolated nucleic acids containing the coding regions of the genes encoding such polypeptides. Also provided are vectors, host cells, antibodies, and recombinant methods for producing human B7-like polypeptides. The invention further relates to diagnostic and therapeutic methods useful for diagnosing and treating disorders related to these novel human B7-like polypeptides.

INTERNATIONAL SEARCH REPORT

Int nal application No.
PCT/US01/20917

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :C07H 21/04; C12N 15/10, 15/11, 15/12

US CL : 536/23.1, 23.5; 435/69.1, 326, 320.1, 455

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 536/23.1, 23.5; 435/69.1, 326, 320.1, 455

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST, DIALOG, BIOSIS, CA, EMBASE, ,MEDLINE

search terms: fiscella, ni, ruben, b7, b7-1, b7-2, cd80, cd86

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 00/36107 A (CORIXA CORPORATION) 22 JUNE 2000, see entire document, particularly SEQ ID NO: 391	1-10, 14, 15

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 01 OCTOBER 2001	Date of mailing of the international search report 16 NOV 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer PHILLIP GAMBEL Telephone No. (703) 308-0196.

Form PCT/ISA/210 (second sheet) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/20917

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-10, 14, 15

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Groups 1-49, claims 1-10, 14, 15, all in part, drawn to an isolated nucleic acids of SEQ ID NO: X or encoding a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively as well as vectors host cells and methods of making a proteins.

For example, If Group 1 is elected, this correlates to Gene No. 1, ATCC Deposit No. PTA02332, SE ID NO: 2 and SEQ ID NO: Y

It is noted that the Groups would be numbering 7, if the X and Y sequences are limited to each row. The Groups number 49, if one can pick and choose a separate X and a separate Y from Table 1.

Applicant is invited to clarify the number of possibilities intended.

Groups 50-98, claims 11, 12 and 16, all in part, drawn to proteins comprising sequences encoded by SEQ ID NO: X and a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively.

Groups 99-147, claim 13, all in part, drawn to an antibody that binds a protein comprising sequences encoded by SEQ ID NO: X and a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively.

Groups 148-196, claim 17 , all in part, drawn to methods of preventing or treating a medical conditions with an isolated nucleic acids of SEQ ID NO: X or encoding a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively.

Groups 197-245, claim 18, all in part, drawn to methods of diagnosing a pathological condition via an isolated nucleic acids of SEQ ID NO: X or encoding a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively.

Groups 246-294, claim 19, all in part, drawn to methods of diagnosing a pathological condition via an antibody that binds a protein encoded by isolated nucleic acids of SEQ ID NO: X or encoding a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively

Groups 295-343, claims 20-21, all in part, drawn to methods of identifying a binding partner of a peptide encoded by isolated nucleic acids of SEQ ID NO: X or encoding a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively

Groups 344-392, claim 22, all in part, drawn to methods of preventing or treating a medical condition with a protein encoded by the nucleic acids of SEQ ID NO: X or encoding a peptide of SEQ ID NO: Y, wherein X and Y are values that correlates to those listed in Table 1 and correspond to one of the cDNA clone IDs, respectively.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack Unity of Invention because they are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for more than one species to be searched, the appropriate additional search fees must be paid. The species are as follows:

The polynucleotides and polypeptides of each of the claims in Table 1 are unrelated, each to the other. The polynucleotides sequence encode structurally distinct polypeptides and do not share a special technical feature. Further the technical feature that links the DNA,proteins, antibody and methods is not a contribution over the prior art of Corixa Corporation (WO 00/36107), particularly SEQ ID NO: 391. Also, see the Search Report. Thus, the technical feature of the polynucleotide sequence is not special and the Groups are not so linked under PCT Rule 13.1. Additionally the claimed methods encompassed different ingredients, process steps and endpoints, which are not so coextensive and which do not share the same technical feature.

The polynucleotides and polypeptides of each of the clones in Table1 are unrelated, each to other. The polynucleotides sequences encode structurally distinct polypeptides and do not share a special technical feature. Furthermore, the technical feature that links the DNA, protein, antibody and methods of PTA-2332 is not a contribution over the prior art of Corixa Corporation (WO 00/36107), particularly SEQ ID NO: 391 set forth in the Search Report. Thus, the technical feature of the polynucleotide sequence is not special and the Groups are not so linked under PCT Rule 13.1. Additionaly, the claimed methods encompass different ingredients, process steps and endpoints which are not coextensive and which do not share the same technical feature.

<110> Human Genome Sciences, Inc.

<120> B7-Like Polynucleotides, Polypeptides, and Antibodies

<130> PT124PCT

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<141> 2001-06-29

<150> 60/215,135
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<211> 2682
<212> DNA
<213> Homo sapiens

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<223> n equals a,t,g, or c

<220>
<221> SITE
<222> (2)
<223> n equals a,t,g, or c

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<210> 6
<211> 1726
<212> DNA
<213> Homo sapiens

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<223> n equals a,t,g, or c

<220>
<221> SITE
<222> (2)
<223> n equals a,t,g, or c

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<210> 7
<211> 1021
<212> DNA
<213> Homo sapiens

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<222> (1)
<223> n equals a,t,g, or c

<220>
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<223> n equals a,t,g, or c

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<210> 8
<211> 1835
<212> DNA
<213> Homo sapiens

<220>

<221> SITE
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<223> n equals a,t,g, or c

<220>
<221> SITE
<222> (2)
<223> n equals a,t,g, or c

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<210> 9
<211> 2626
<212> DNA
<213> Homo sapiens

<400> 9
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<210> 10
<211> 1675
<212> DNA
<213> Homo sapiens

<220>
<221> SITE
<222> (1549)
<223> n equals a,t,g, or c

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<210> 11
<211> 786
<212> DNA
<213> Homo sapiens

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cctgactctg aaagtcaaag cttcctacag gaaaataaac actcacatcc taaaggttcc 660
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<212> DNA
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<400> 12
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<210> 13
<211> 2799
<212> DNA
<213> Homo sapiens

<400> 13
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<210> 14
<211> 282
<212> PRT
<213> Homo sapiens

<400> 14

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Met Ala Ser Leu Gly Gln Ile Leu Phe Trp Ser Ile Ile Ser Ile Ile
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Ile Ile Leu Ala Gly Ala Ile Ala Leu Ile Ile Gly Phe Gly Ile Ser
             20                  25                  30

Gly Arg His Ser Ile Thr Val Thr Thr Val Ala Ser Ala Gly Asn Ile
         35                  40                  45

Gly Glu Asp Gly Ile Leu Ser Cys Thr Phe Glu Pro Asp Ile Lys Leu
     50                  55                  60

Ser Asp Ile Val Ile Gln Trp Leu Lys Glu Gly Val Leu Gly Leu Val
 65                  70                  75                  80

His Glu Phe Lys Glu Gly Lys Asp Glu Leu Ser Glu Gln Asp Glu Met
                 85                  90                  95

Phe Arg Gly Arg Thr Ala Val Phe Ala Asp Gln Val Ile Val Gly Asn
            100                 105                 110

Ala Ser Leu Arg Leu Lys Asn Val Gln Leu Thr Asp Ala Gly Thr Tyr
        115                 120                 125

Lys Cys Tyr Ile Ile Thr Ser Lys Gly Lys Gly Asn Ala Asn Leu Glu
    130                 135                 140

Tyr Lys Thr Gly Ala Phe Ser Met Pro Glu Val Asn Val Asp Tyr Asn
145                 150                 155                 160

Ala Ser Ser Glu Thr Leu Arg Cys Glu Ala Pro Arg Trp Phe Pro Gln
                165                 170                 175

Pro Thr Val Val Trp Ala Ser Gln Val Asp Gln Gly Ala Asn Phe Ser
```

```
            180                 185                 190

Glu Val Ser Asn Thr Ser Phe Glu Leu Asn Ser Glu Asn Val Thr Met
        195                 200                 205

Lys Val Val Ser Val Leu Tyr Asn Val Thr Ile Asn Asn Thr Tyr Ser
    210                 215                 220

Cys Met Ile Glu Asn Asp Ile Ala Lys Ala Thr Gly Asp Ile Lys Val
225                 230                 235                 240

Thr Glu Ser Glu Ile Lys Arg Arg Ser His Leu Gln Leu Leu Asn Ser
                245                 250                 255

Lys Ala Ser Leu Cys Val Ser Ser Phe Phe Ala Ile Ser Trp Ala Leu
            260                 265                 270

Leu Pro Leu Ser Pro Tyr Leu Met Leu Lys
        275                 280
```

<210> 15
<211> 283
<212> PRT
<213> Homo sapiens

<400> 15

```
Met Ile Phe Leu Leu Leu Met Leu Ser Leu Glu Leu Gln Leu His Gln
  1               5                  10                  15

Ile Ala Ala Leu Phe Thr Val Thr Val Pro Lys Glu Leu Tyr Ile Ile
             20                  25                  30

Glu His Gly Ser Asn Val Thr Leu Glu Cys Asn Phe Asp Thr Gly Ser
         35                  40                  45

His Val Asn Leu Gly Ala Ile Thr Ala Ser Leu Gln Lys Val Glu Asn
     50                  55                  60

Asp Thr Ser Pro His Arg Glu Arg Ala Thr Leu Leu Glu Glu Gln Leu
 65                  70                  75                  80

Pro Leu Gly Lys Ala Ser Phe His Ile Pro Gln Val Gln Val Arg Asp
                 85                  90                  95

Glu Gly Gln Tyr Gln Cys Ile Ile Ile Tyr Gly Val Ala Trp Asp Tyr
            100                 105                 110

Lys Tyr Leu Thr Leu Lys Val Lys Ala Ser Tyr Arg Lys Ile Asn Thr
        115                 120                 125

His Ile Leu Lys Val Pro Glu Thr Asp Glu Val Glu Leu Thr Cys Gln
    130                 135                 140

Ala Thr Gly Tyr Pro Leu Ala Glu Val Ser Trp Pro Asn Val Ser Val
145                 150                 155                 160

Pro Ala Asn Thr Ser His Ser Arg Thr Pro Glu Gly Leu Tyr Gln Val
                165                 170                 175

Thr Ser Val Leu Arg Leu Lys Pro Pro Pro Gly Arg Asn Phe Ser Cys
```

```
            180                 185                 190

Val Phe Trp Asn Thr His Val Arg Glu Leu Thr Leu Ala Ser Ile Asp
        195                 200                 205

Leu Gln Ser Gln Met Glu Pro Arg Thr His Pro Thr Trp Leu Leu His
    210                 215                 220

Ile Phe Ile Pro Ser Cys Ile Ile Ala Phe Ile Phe Ile Ala Thr Val
225                 230                 235                 240

Ile Ala Leu Arg Lys Gln Leu Cys Gln Lys Leu Tyr Ser Ser Lys Asp
                245                 250                 255

Thr Thr Lys Arg Pro Val Thr Thr Thr Lys Arg Glu Val Asn Ser Ala
            260                 265                 270

Val Asn Leu Asn Leu Trp Ser Trp Glu Pro Gly
        275                 280


<210> 16
<211> 318
<212> PRT
<213> Homo sapiens

<400> 16
Met Ala Leu Met Leu Ser Leu Val Leu Ser Leu Leu Lys Leu Gly Ser
  1               5                  10                  15

Gly Gln Trp Gln Val Phe Gly Pro Asp Lys Pro Val Gln Ala Leu Val
             20                  25                  30

Gly Glu Asp Ala Ala Phe Ser Cys Phe Leu Ser Pro Lys Thr Asn Ala
         35                  40                  45

Glu Ala Met Glu Val Arg Phe Phe Arg Gly Gln Phe Ser Ser Val Val
     50                  55                  60

His Leu Tyr Arg Asp Gly Lys Asp Gln Pro Phe Met Gln Met Pro Gln
 65                  70                  75                  80

Tyr Gln Gly Arg Thr Lys Leu Val Lys Asp Ser Ile Ala Glu Gly Arg
                 85                  90                  95

Ile Ser Leu Arg Leu Glu Asn Ile Thr Val Leu Asp Ala Gly Leu Tyr
            100                 105                 110

Gly Cys Arg Ile Ser Ser Gln Ser Tyr Tyr Gln Lys Ala Ile Trp Glu
        115                 120                 125

Leu Gln Val Ser Ala Leu Gly Ser Val Pro Leu Ile Ser Ile Ala Gly
    130                 135                 140

Tyr Val Asp Arg Asp Ile Gln Leu Leu Cys Gln Ser Ser Gly Trp Phe
145                 150                 155                 160

Pro Arg Pro Thr Ala Lys Trp Lys Gly Pro Gln Gly Gln Asp Leu Ser
                165                 170                 175

Thr Asp Ser Arg Thr Asn Arg Asp Met His Gly Leu Phe Asp Val Glu
```

```
            180                 185                 190

Ile Ser Leu Thr Val Gln Glu Asn Ala Gly Ser Ile Ser Cys Ser Met
        195                 200                 205

Arg His Ala His Leu Ser Arg Glu Val Glu Ser Arg Val Gln Ile Gly
    210                 215                 220

Asp Trp Arg Arg Lys His Gly Gln Ala Gly Lys Arg Lys Tyr Ser Ser
225                 230                 235                 240

Ser His Ile Tyr Asp Ser Phe Pro Ser Leu Ser Phe Met Asp Phe Tyr
                245                 250                 255

Ile Leu Arg Pro Val Gly Pro Cys Arg Ala Lys Leu Val Met Gly Thr
            260                 265                 270

Leu Lys Leu Gln Ile Leu Gly Glu Val His Phe Val Glu Lys Pro His
        275                 280                 285

Ser Leu Leu Gln Ile Ser Gly Gly Ser Thr Thr Leu Lys Lys Gly Pro
    290                 295                 300

Asn Pro Trp Ser Phe Pro Ser Pro Cys Ala Leu Phe Pro Thr
305                 310                 315


<210> 17
<211> 454
<212> PRT
<213> Homo sapiens

<400> 17
Met Glu Pro Ala Ala Ala Leu His Phe Ser Arg Pro Ala Ser Leu Leu
  1               5                  10                  15

Leu Leu Leu Ser Leu Cys Ala Leu Val Ser Ala Gln Phe Thr Val Val
             20                  25                  30

Gly Pro Ala Asn Pro Ile Leu Ala Met Val Gly Glu Asn Thr Thr Leu
         35                  40                  45

Arg Cys His Leu Ser Pro Glu Lys Asn Ala Glu Asp Met Glu Val Arg
     50                  55                  60

Trp Phe Arg Ser Gln Phe Ser Pro Ala Val Phe Val Tyr Lys Gly Gly
 65                  70                  75                  80

Arg Glu Arg Thr Glu Glu Gln Met Glu Glu Tyr Arg Gly Arg Ile Thr
                 85                  90                  95

Phe Val Ser Lys Asp Ile Asn Arg Gly Ser Val Ala Leu Val Ile His
            100                 105                 110

Asn Val Thr Ala Gln Glu Asn Gly Ile Tyr Arg Cys Tyr Phe Gln Glu
        115                 120                 125

Gly Arg Ser Tyr Asp Glu Ala Ile Leu Arg Leu Val Val Ala Gly Leu
    130                 135                 140

Gly Ser Lys Pro Leu Ile Glu Ile Lys Ala Gln Glu Asp Gly Ser Ile
```

```
145                 150                 155                 160

Trp Leu Glu Cys Ile Ser Gly Gly Trp Tyr Pro Glu Pro Leu Thr Val
                165                 170                 175

Trp Arg Asp Pro Tyr Gly Glu Val Val Pro Ala Leu Lys Glu Val Ser
            180                 185                 190

Ile Ala Asp Ala Asp Gly Leu Phe Met Val Thr Thr Ala Val Ile Ile
        195                 200                 205

Arg Asp Lys Tyr Val Arg Asn Val Ser Cys Ser Val Asn Asn Thr Leu
    210                 215                 220

Leu Gly Gln Glu Lys Glu Thr Val Ile Phe Ile Pro Glu Ser Phe Met
225                 230                 235                 240

Pro Ser Ala Ser Pro Trp Met Val Ala Leu Ala Val Ile Leu Thr Ala
                245                 250                 255

Ser Pro Trp Met Val Ser Met Thr Val Ile Leu Ala Val Phe Ile Ile
            260                 265                 270

Phe Met Ala Val Ser Ile Cys Cys Ile Lys Lys Leu Gln Arg Glu Lys
        275                 280                 285

Lys Ile Leu Ser Gly Glu Lys Lys Val Glu Gln Glu Glu Lys Glu Ile
    290                 295                 300

Ala Gln Gln Leu Gln Glu Glu Leu Arg Trp Arg Arg Thr Phe Leu His
305                 310                 315                 320

Ala Ala Asp Val Val Leu Asp Pro Asp Thr Ala His Pro Glu Leu Phe
                325                 330                 335

Leu Ser Glu Asp Arg Arg Ser Val Arg Arg Gly Pro Tyr Arg Gln Arg
            340                 345                 350

Val Pro Asp Asn Pro Glu Arg Phe Asp Ser Gln Pro Cys Val Leu Gly
        355                 360                 365

Trp Glu Ser Phe Ala Ser Gly Lys His Tyr Arg Gly Asn Phe Thr Glu
    370                 375                 380

Trp Gly Pro Thr Arg Ala Tyr Arg Ile Asn Ser Leu Asp Ser Gln Pro
385                 390                 395                 400

Cys Arg Lys Pro Trp Pro Ser Gln Gln Pro Pro His Asn Pro Pro Asn
                405                 410                 415

Glu Arg His Ala Leu Leu Pro Ser Gly His Val Arg Glu His Leu Pro
            420                 425                 430

Ala Ala Phe Phe Thr Pro Thr Pro Ala Leu Cys Pro Ser Phe Leu Leu
        435                 440                 445

Leu Thr Ser Leu Trp Leu
    450
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<210> 18

<211> 414
<212> PRT
<213> Homo sapiens

<400> 18

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Met Arg Glu Ile Val Trp Tyr Arg Val Thr Asp Gly Gly Thr Ile Lys
  1               5                  10                  15

Gln Lys Ile Phe Thr Phe Asp Ala Met Phe Ser Thr Asn Tyr Ser His
             20                  25                  30

Met Glu Asn Tyr Arg Lys Arg Glu Asp Leu Val Tyr Gln Ser Thr Val
         35                  40                  45

Arg Leu Pro Glu Val Arg Ile Ser Asp Asn Gly Pro Tyr Glu Cys His
     50                  55                  60

Val Gly Ile Tyr Asp Arg Ala Thr Arg Glu Lys Val Val Leu Ala Ser
 65                  70                  75                  80

Gly Asn Ile Phe Leu Asn Val Met Ala Pro Pro Thr Ser Ile Glu Val
                85                  90                  95

Val Ala Ala Asp Thr Pro Ala Pro Phe Ser Arg Tyr Gln Ala Gln Asn
            100                 105                 110

Phe Thr Leu Val Cys Ile Val Ser Gly Gly Lys Pro Ala Pro Met Val
        115                 120                 125

Tyr Phe Lys Arg Asp Gly Glu Pro Ile Asp Ala Val Pro Leu Ser Glu
    130                 135                 140

Pro Pro Ala Ala Ser Ser Gly Pro Leu Gln Asp Ser Arg Pro Phe Arg
145                 150                 155                 160

Ser Leu Leu His Arg Asp Leu Asp Asp Thr Lys Met Gln Lys Ser Leu
                165                 170                 175

Ser Leu Leu Asp Ala Glu Asn Arg Gly Gly Arg Pro Tyr Thr Glu Arg
            180                 185                 190

Pro Ser Arg Gly Leu Thr Pro Asp Pro Asn Ile Leu Leu Gln Pro Thr
        195                 200                 205

Thr Glu Asn Ile Pro Glu Thr Val Val Ser Arg Glu Phe Pro Arg Trp
    210                 215                 220

Val His Ser Ala Glu Pro Thr Tyr Phe Leu Arg His Ser Arg Thr Pro
225                 230                 235                 240

Ser Ser Asp Gly Thr Val Glu Val Arg Ala Leu Leu Thr Trp Thr Leu
                245                 250                 255

Asn Pro Gln Ile Asp Asn Glu Ala Leu Phe Ser Cys Glu Val Lys His
            260                 265                 270

Pro Ala Leu Ser Met Pro Met Gln Ala Glu Val Thr Leu Val Ala Pro
        275                 280                 285

Lys Gly Pro Lys Ile Val Met Thr Pro Ser Arg Ala Arg Val Gly Asp
    290                 295                 300
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```
Thr Val Arg Ile Leu Val His Gly Phe Gln Asn Glu Val Phe Pro Glu
305                 310                 315                 320

Pro Met Phe Thr Trp Thr Arg Val Gly Ser Arg Leu Leu Asp Gly Ser
                325                 330                 335

Ala Glu Phe Asp Gly Lys Glu Leu Val Leu Glu Arg Val Pro Ala Glu
            340                 345                 350

Leu Asn Gly Ser Met Tyr Arg Cys Thr Ala Gln Asn Pro Leu Gly Ser
        355                 360                 365

Thr Asp Thr His Thr Arg Leu Ile Val Phe Glu Asn Pro Asn Ile Pro
    370                 375                 380

Arg Gly Thr Glu Asp Ser Asn Gly Ser Ile Gly Pro Thr Gly Ala Arg
385                 390                 395                 400

Leu Thr Leu Val Leu Ala Leu Thr Val Ile Leu Glu Leu Thr
                405                 410


<210> 19
<211> 159
<212> PRT
<213> Homo sapiens

<400> 19
Met Glu Pro Ala Ala Ala Leu His Phe Ser Arg Pro Ala Ser Leu Leu
  1               5                  10                  15

Leu Leu Leu Ser Leu Cys Ala Leu Val Ser Ala Gln Val Thr Val Val
            20                  25                  30

Gly Pro Thr Asp Pro Ile Leu Ala Met Val Gly Glu Asn Thr Thr Leu
        35                  40                  45

Arg Cys Cys Leu Ser Pro Glu Glu Asn Ala Glu Asp Met Glu Val Arg
    50                  55                  60

Trp Phe Gln Ser Gln Phe Ser Pro Ala Val Phe Val Tyr Lys Gly Gly
65                  70                  75                  80

Arg Glu Arg Thr Glu Glu Gln Lys Glu Glu Tyr Arg Gly Arg Thr Thr
                85                  90                  95

Phe Val Ser Lys Asp Ser Arg Gly Ser Val Ala Leu Ile Ile His Asn
            100                 105                 110

Val Thr Ala Glu Asp Asn Gly Ile Tyr Gln Cys Tyr Phe Gln Glu Gly
        115                 120                 125

Arg Ser Cys Asn Glu Ala Ile Leu His Leu Val Val Ala Asp Gln His
    130                 135                 140

Asn Pro Leu Ser Trp Ile Pro Ile Pro Gln Gly Thr Leu Ser Leu
145                 150                 155


<210> 20
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<211> 461
<212> PRT
<213> Homo sapiens

<400> 20

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Met Ala Leu Met Leu Ser Leu Val Leu Ser Leu Leu Lys Leu Gly Ser
  1               5                  10                  15

Gly Gln Trp Gln Val Phe Gly Pro Asp Lys Pro Val Gln Ala Leu Val
             20                  25                  30

Gly Glu Asp Ala Ala Phe Ser Cys Phe Leu Ser Pro Lys Thr Asn Ala
         35                  40                  45

Glu Ala Met Glu Val Arg Phe Phe Arg Gly Gln Phe Ser Ser Val Val
     50                  55                  60

His Leu Tyr Arg Asp Gly Lys Asp Gln Pro Phe Met Gln Met Pro Gln
 65                  70                  75                  80

Tyr Gln Gly Arg Thr Lys Leu Val Lys Asp Ser Ile Ala Glu Gly Arg
                 85                  90                  95

Ile Ser Leu Arg Leu Glu Asn Ile Thr Val Leu Asp Ala Gly Leu Tyr
            100                 105                 110

Gly Cys Arg Ile Ser Ser Gln Ser Tyr Tyr Gln Lys Ala Ile Trp Glu
        115                 120                 125

Leu Gln Val Ser Ala Leu Gly Ser Val Pro Leu Ile Ser Ile Thr Gly
    130                 135                 140

Tyr Val Asp Arg Asp Ile Gln Leu Leu Cys Gln Ser Ser Gly Trp Phe
145                 150                 155                 160

Pro Arg Pro Thr Ala Lys Trp Lys Gly Pro Gln Gly Gln Asp Leu Ser
            165                 170                 175

Thr Asp Ser Arg Thr Asn Arg Asp Met His Gly Leu Phe Asp Val Glu
        180                 185                 190

Ile Ser Leu Thr Val Gln Glu Asn Ala Gly Ser Ile Ser Cys Ser Met
    195                 200                 205

Arg His Ala His Leu Ser Arg Glu Val Glu Ser Arg Val Gln Ile Gly
    210                 215                 220

Asp Thr Phe Phe Glu Pro Ile Ser Trp His Leu Ala Thr Lys Val Leu
225                 230                 235                 240

Gly Ile Leu Cys Cys Gly Leu Phe Phe Gly Ile Val Gly Leu Lys Ile
                245                 250                 255

Phe Phe Ser Lys Phe Gln Trp Lys Ile Gln Ala Glu Leu Asp Trp Arg
            260                 265                 270

Arg Lys His Gly Gln Ala Glu Leu Arg Asp Ala Arg Lys His Ala Val
        275                 280                 285

Glu Val Thr Leu Asp Pro Glu Thr Ala His Pro Lys Leu Cys Val Ser
    290                 295                 300
```

```
Asp Leu Lys Thr Val Thr His Arg Lys Ala Pro Gln Glu Val Pro His
305                 310                 315                 320

Ser Glu Lys Arg Phe Thr Arg Lys Ser Val Val Ala Ser Gln Ser Phe
                325                 330                 335

Gln Ala Gly Lys His Tyr Trp Glu Val Asp Gly Gly His Asn Lys Arg
            340                 345                 350

Trp Arg Val Gly Val Cys Arg Asp Asp Val Asp Arg Arg Lys Glu Tyr
        355                 360                 365

Val Thr Leu Ser Pro Asp His Gly Tyr Trp Val Leu Arg Leu Asn Gly
    370                 375                 380

Glu His Leu Tyr Phe Thr Leu Asn Pro Arg Phe Ile Ser Val Phe Pro
385                 390                 395                 400

Arg Thr Pro Pro Thr Lys Ile Gly Val Phe Leu Asp Tyr Glu Cys Gly
                405                 410                 415

Thr Ile Ser Phe Phe Asn Ile Asn Asp Gln Ser Leu Ile Tyr Thr Leu
            420                 425                 430

Thr Cys Arg Phe Glu Gly Leu Leu Arg Pro Tyr Ile Glu Tyr Pro Ser
        435                 440                 445

Tyr Asn Glu Gln Asn Gly Thr Pro Arg Asp Lys Gln Gln
    450                 455                 460


<210> 21
<211> 13
<212> PRT
<213> Homo sapiens

<400> 21
Met Ala Ser Leu Gly Gln Ile Leu Phe Trp Ser Ile Ile
  1               5                  10


<210> 22
<211> 23
<212> PRT
<213> Homo sapiens

<400> 22
Leu Phe Leu Leu Leu Glu Ile Ser Thr His Leu Cys Phe Trp Lys Ser
  1               5                  10                  15

Leu Arg Lys Leu Glu Gly Lys
            20


<210> 23
<211> 93
<212> PRT
<213> Homo sapiens

<220>
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<221> SITE
<222> (89)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (92)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 23
Met Ile Phe Leu Leu Leu Met Leu Ser Leu Glu Leu Gln Leu His Gln
1 5 10 15

Ile Ala Ala Leu Phe Thr Val Thr Val Pro Lys Glu Leu Tyr Ile Ile
20 25 30

Glu His Gly Ser Asn Val Thr Leu Glu Cys Asn Phe Asp Thr Gly Ser
35 40 45

His Val Asn Leu Gly Ala Ile Thr Ala Ser Leu Gln Lys Val Glu Asn
50 55 60

Asp Thr Ser Pro His Arg Glu Arg Ala Thr Leu Leu Glu Glu Gln Leu
65 70 75 80

Pro Leu Gly Lys Ala Ser Phe Pro Xaa Leu Lys Xaa Lys
85 90

<210> 24
<211> 461
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (234)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (236)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 24
Met Ala Leu Met Leu Ser Leu Val Leu Ser Leu Leu Lys Leu Gly Ser
1 5 10 15

Gly Gln Trp Gln Val Phe Gly Pro Asp Lys Pro Val Gln Ala Leu Val
20 25 30

Gly Glu Asp Ala Ala Phe Ser Cys Phe Leu Ser Pro Lys Thr Asn Ala
35 40 45

Glu Ala Met Glu Val Arg Phe Phe Arg Gly Gln Phe Ser Ser Val Val
50 55 60

His Leu Tyr Arg Asp Gly Lys Asp Gln Pro Phe Met Gln Met Pro Gln
65 70 75 80

Tyr Gln Gly Arg Thr Lys Leu Val Lys Asp Ser Ile Ala Glu Gly Arg

```
                85                  90                  95

Ile Ser Leu Arg Leu Glu Asn Ile Thr Val Leu Asp Ala Gly Leu Tyr
            100                 105                 110

Gly Cys Arg Ile Ser Ser Gln Ser Tyr Tyr Gln Lys Ala Ile Trp Glu
        115                 120                 125

Leu Gln Val Ser Ala Leu Gly Ser Val Pro Leu Ile Ser Ile Thr Gly
    130                 135                 140

Tyr Val Asp Arg Asp Ile Gln Leu Leu Cys Gln Ser Ser Gly Trp Phe
145                 150                 155                 160

Pro Arg Pro Thr Ala Lys Trp Lys Gly Pro Gln Gly Gln Asp Leu Ser
                165                 170                 175

Thr Asp Ser Arg Thr Asn Arg Asp Met His Gly Leu Phe Asp Val Glu
            180                 185                 190

Ile Ser Leu Thr Val Gln Glu Asn Ala Gly Ser Ile Ser Cys Ser Met
        195                 200                 205

Arg His Ala His Leu Ser Arg Glu Val Glu Ser Arg Val Gln Ile Gly
    210                 215                 220

Asp Thr Phe Phe Glu Pro Ile Ser Trp Xaa Leu Xaa Thr Lys Val Leu
225                 230                 235                 240

Gly Ile Leu Cys Cys Gly Leu Phe Phe Gly Ile Val Gly Leu Lys Ile
                245                 250                 255

Phe Phe Ser Lys Phe Gln Trp Lys Ile Gln Ala Glu Leu Asp Trp Arg
            260                 265                 270

Arg Lys His Gly Gln Ala Glu Leu Arg Asp Ala Arg Lys His Ala Val
        275                 280                 285

Glu Val Thr Leu Asp Pro Glu Thr Ala His Pro Lys Leu Cys Val Ser
    290                 295                 300

Asp Leu Lys Thr Val Thr His Arg Lys Ala Pro Gln Glu Val Pro His
305                 310                 315                 320

Ser Glu Lys Arg Phe Thr Arg Lys Ser Val Val Ala Ser Gln Ser Phe
                325                 330                 335

Gln Ala Gly Lys His Tyr Trp Glu Val Asp Gly Gly His Asn Lys Arg
            340                 345                 350

Trp Arg Val Gly Val Cys Arg Asp Asp Val Asp Arg Arg Lys Glu Tyr
        355                 360                 365

Val Thr Leu Ser Pro Asp His Gly Tyr Trp Val Leu Arg Leu Asn Gly
    370                 375                 380

Glu His Leu Tyr Phe Thr Leu Asn Pro Arg Phe Ile Ser Val Phe Pro
385                 390                 395                 400

Arg Thr Pro Pro Thr Lys Ile Gly Val Phe Leu Asp Tyr Glu Cys Gly
                405                 410                 415
```

```
Thr Ile Ser Phe Phe Asn Ile Asn Asp Gln Ser Leu Ile Tyr Thr Leu
            420                 425                 430

Thr Cys Arg Phe Glu Gly Leu Leu Arg Pro Tyr Ile Glu Tyr Pro Ser
        435                 440                 445

Tyr Asn Glu Gln Asn Gly Thr Pro Arg Asp Lys Gln Gln
    450                 455                 460


<210> 25
<211> 402
<212> PRT
<213> Homo sapiens

<400> 25
Met Glu Pro Ala Ala Ala Leu His Phe Ser Arg Pro Ala Ser Leu Leu
  1               5                  10                  15

Leu Leu Leu Ser Leu Cys Ala Leu Val Ser Ala Gln Phe Thr Val Val
             20                  25                  30

Gly Pro Ala Asn Pro Ile Leu Ala Met Val Gly Glu Asn Thr Thr Leu
         35                  40                  45

Arg Cys His Leu Ser Pro Glu Lys Asn Ala Glu Asp Met Glu Val Arg
     50                  55                  60

Trp Phe Arg Ser Gln Phe Ser Pro Ala Val Phe Val Tyr Lys Gly Gly
 65                  70                  75                  80

Arg Glu Arg Thr Glu Glu Gln Met Glu Glu Tyr Arg Gly Arg Ile Thr
                 85                  90                  95

Phe Val Ser Lys Asp Ile Asn Arg Gly Ser Val Ala Leu Val Ile His
            100                 105                 110

Asn Val Thr Ala Gln Glu Asn Gly Ile Tyr Arg Cys Tyr Phe Gln Glu
        115                 120                 125

Gly Arg Ser Tyr Asp Glu Ala Ile Leu Arg Leu Val Val Ala Gly Leu
    130                 135                 140

Gly Ser Lys Pro Leu Ile Glu Ile Lys Ala Gln Glu Asp Gly Ser Ile
145                 150                 155                 160

Trp Leu Glu Cys Ile Ser Gly Gly Trp Tyr Pro Glu Pro Leu Thr Val
                165                 170                 175

Trp Arg Asp Pro Tyr Gly Glu Val Val Pro Ala Leu Lys Glu Val Ser
            180                 185                 190

Ile Ala Asp Ala Asp Gly Leu Phe Met Val Thr Thr Ala Val Ile Ile
        195                 200                 205

Arg Asp Lys Tyr Val Arg Asn Val Ser Cys Ser Val Asn Asn Thr Leu
    210                 215                 220

Leu Gly Gln Glu Lys Glu Thr Val Ile Phe Ile Pro Glu Ser Phe Met
225                 230                 235                 240
```

```
Pro Ser Ala Ser Pro Trp Met Val Ala Leu Ala Val Ile Leu Thr Ala
                245                 250                 255

Ser Pro Trp Met Val Ser Met Thr Val Ile Leu Ala Val Phe Ile Ile
            260                 265                 270

Phe Met Ala Val Ser Ile Cys Cys Ile Lys Lys Leu Gln Arg Glu Lys
        275                 280                 285

Lys Ile Leu Ser Gly Glu Lys Lys Val Glu Gln Glu Glu Lys Glu Ile
    290                 295                 300

Ala Gln Gln Leu Gln Glu Glu Leu Arg Trp Arg Arg Thr Phe Leu His
305                 310                 315                 320

Ala Ala Asp Val Val Leu Asp Pro Asp Thr Ala His Pro Glu Leu Phe
                325                 330                 335

Leu Ser Glu Asp Arg Arg Ser Val Arg Arg Gly Pro Tyr Arg Gln Arg
            340                 345                 350

Val Pro Asp Asn Pro Glu Arg Phe Asp Ser Gln Pro Cys Val Leu Gly
        355                 360                 365

Trp Glu Ser Phe Ala Ser Gly Lys His Tyr Arg Gly Asn Phe Thr Glu
    370                 375                 380

Trp Gly Pro Thr Arg Ala Tyr Arg Ile Asn Ser Leu Asp Ser Gln Pro
385                 390                 395                 400

Cys Arg
```

<210> 26
<211> 20
<212> PRT
<213> Homo sapiens

```
<400> 26
Ser Lys Ala Ser Leu Cys Val Ser Ser Phe Phe Ala Ile Ser Trp Ala
  1               5                  10                  15

Leu Leu Pro Leu
            20
```

<210> 27
<211> 255
<212> PRT
<213> Homo sapiens

```
<400> 27
Met Ala Ser Leu Gly Gln Ile Leu Phe Trp Ser Ile Ile Ser Ile Ile
  1               5                  10                  15

Ile Ile Leu Ala Gly Ala Ile Ala Leu Ile Ile Gly Phe Gly Ile Ser
            20                  25                  30

Gly Arg His Ser Ile Thr Val Thr Thr Val Ala Ser Ala Gly Asn Ile
```

```
        35                  40                  45

Gly Glu Asp Gly Ile Leu Ser Cys Thr Phe Glu Pro Asp Ile Lys Leu
     50                  55                  60

Ser Asp Ile Val Ile Gln Trp Leu Lys Glu Gly Val Leu Gly Leu Val
 65                  70                  75                  80

His Glu Phe Lys Glu Gly Lys Asp Glu Leu Ser Glu Gln Asp Glu Met
                 85                  90                  95

Phe Arg Gly Arg Thr Ala Val Phe Ala Asp Gln Val Ile Val Gly Asn
            100                 105                 110

Ala Ser Leu Arg Leu Lys Asn Val Gln Leu Thr Asp Ala Gly Thr Tyr
        115                 120                 125

Lys Cys Tyr Ile Ile Thr Ser Lys Gly Lys Gly Asn Ala Asn Leu Glu
    130                 135                 140

Tyr Lys Thr Gly Ala Phe Ser Met Pro Glu Val Asn Val Asp Tyr Asn
145                 150                 155                 160

Ala Ser Ser Glu Thr Leu Arg Cys Glu Ala Pro Arg Trp Phe Pro Gln
                165                 170                 175

Pro Thr Val Val Trp Ala Ser Gln Val Asp Gln Gly Ala Asn Phe Ser
            180                 185                 190

Glu Val Ser Asn Thr Ser Phe Glu Leu Asn Ser Glu Asn Val Thr Met
        195                 200                 205

Lys Val Val Ser Val Leu Tyr Asn Val Thr Ile Asn Asn Thr Tyr Ser
    210                 215                 220

Cys Met Ile Glu Asn Asp Ile Ala Lys Ala Thr Gly Asp Ile Lys Val
225                 230                 235                 240

Thr Glu Ser Glu Ile Lys Arg Arg Ser His Leu Gln Leu Leu Asn
                245                 250                 255


<210> 28
<211> 231
<212> PRT
<213> Homo sapiens

<400> 28
Leu Ile Ile Gly Phe Gly Ile Ser Gly Arg His Ser Ile Thr Val Thr
  1               5                  10                  15

Thr Val Ala Ser Ala Gly Asn Ile Gly Glu Asp Gly Ile Leu Ser Cys
             20                  25                  30

Thr Phe Glu Pro Asp Ile Lys Leu Ser Asp Ile Val Ile Gln Trp Leu
         35                  40                  45

Lys Glu Gly Val Leu Gly Leu Val His Glu Phe Lys Glu Gly Lys Asp
     50                  55                  60

Glu Leu Ser Glu Gln Asp Glu Met Phe Arg Gly Arg Thr Ala Val Phe
```

```
65                  70                  75                  80

Ala Asp Gln Val Ile Val Gly Asn Ala Ser Leu Arg Leu Lys Asn Val
                85                  90                  95

Gln Leu Thr Asp Ala Gly Thr Tyr Lys Cys Tyr Ile Ile Thr Ser Lys
            100                 105                 110

Gly Lys Gly Asn Ala Asn Leu Glu Tyr Lys Thr Gly Ala Phe Ser Met
        115                 120                 125

Pro Glu Val Asn Val Asp Tyr Asn Ala Ser Ser Glu Thr Leu Arg Cys
    130                 135                 140

Glu Ala Pro Arg Trp Phe Pro Gln Pro Thr Val Val Trp Ala Ser Gln
145                 150                 155                 160

Val Asp Gln Gly Ala Asn Phe Ser Glu Val Ser Asn Thr Ser Phe Glu
                165                 170                 175

Leu Asn Ser Glu Asn Val Thr Met Lys Val Val Ser Val Leu Tyr Asn
            180                 185                 190

Val Thr Ile Asn Asn Thr Tyr Ser Cys Met Ile Glu Asn Asp Ile Ala
        195                 200                 205

Lys Ala Thr Gly Asp Ile Lys Val Thr Glu Ser Glu Ile Lys Arg Arg
    210                 215                 220

Ser His Leu Gln Leu Leu Asn
225                 230


<210> 29
<211> 24
<212> PRT
<213> Homo sapiens

<400> 29
Met Ala Ser Leu Gly Gln Ile Leu Phe Trp Ser Ile Ile Ser Ile Ile
  1               5                  10                  15

Ile Ile Leu Ala Gly Ala Ile Ala
            20


<210> 30
<211> 30
<212> PRT
<213> Homo sapiens

<400> 30
Pro Thr Trp Leu Leu His Ile Phe Ile Pro Ser Cys Ile Ile Ala Phe
  1               5                  10                  15

Ile Phe Ile Ala Thr Val Ile Ala Leu Arg Lys Gln Leu Cys
            20                  25                  30


<210> 31
<211> 218
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<212> PRT
<213> Homo sapiens

<400> 31
Met Ile Phe Leu Leu Leu Met Leu Ser Leu Glu Leu Gln Leu His Gln
1 5 10 15

Ile Ala Ala Leu Phe Thr Val Thr Val Pro Lys Glu Leu Tyr Ile Ile
20 25 30

Glu His Gly Ser Asn Val Thr Leu Glu Cys Asn Phe Asp Thr Gly Ser
35 40 45

His Val Asn Leu Gly Ala Ile Thr Ala Ser Leu Gln Lys Val Glu Asn
50 55 60

Asp Thr Ser Pro His Arg Glu Arg Ala Thr Leu Leu Glu Glu Gln Leu
65 70 75 80

Pro Leu Gly Lys Ala Ser Phe His Ile Pro Gln Val Gln Val Arg Asp
85 90 95

Glu Gly Gln Tyr Gln Cys Ile Ile Ile Tyr Gly Val Ala Trp Asp Tyr
100 105 110

Lys Tyr Leu Thr Leu Lys Val Lys Ala Ser Tyr Arg Lys Ile Asn Thr
115 120 125

His Ile Leu Lys Val Pro Glu Thr Asp Glu Val Glu Leu Thr Cys Gln
130 135 140

Ala Thr Gly Tyr Pro Leu Ala Glu Val Ser Trp Pro Asn Val Ser Val
145 150 155 160

Pro Ala Asn Thr Ser His Ser Arg Thr Pro Glu Gly Leu Tyr Gln Val
165 170 175

Thr Ser Val Leu Arg Leu Lys Pro Pro Pro Gly Arg Asn Phe Ser Cys
180 185 190

Val Phe Trp Asn Thr His Val Arg Glu Leu Thr Leu Ala Ser Ile Asp
195 200 205

Leu Gln Ser Gln Met Glu Pro Arg Thr His
210 215

<210> 32
<211> 199
<212> PRT
<213> Homo sapiens

<400> 32
Leu Phe Thr Val Thr Val Pro Lys Glu Leu Tyr Ile Ile Glu His Gly
1 5 10 15

Ser Asn Val Thr Leu Glu Cys Asn Phe Asp Thr Gly Ser His Val Asn
20 25 30

Leu Gly Ala Ile Thr Ala Ser Leu Gln Lys Val Glu Asn Asp Thr Ser
35 40 45

```
Pro His Arg Glu Arg Ala Thr Leu Leu Glu Glu Gln Leu Pro Leu Gly
     50                  55                  60

Lys Ala Ser Phe His Ile Pro Gln Val Gln Val Arg Asp Glu Gly Gln
 65                  70                  75                  80

Tyr Gln Cys Ile Ile Ile Tyr Gly Val Ala Trp Asp Tyr Lys Tyr Leu
                85                  90                  95

Thr Leu Lys Val Lys Ala Ser Tyr Arg Lys Ile Asn Thr His Ile Leu
            100                 105                 110

Lys Val Pro Glu Thr Asp Glu Val Glu Leu Thr Cys Gln Ala Thr Gly
        115                 120                 125

Tyr Pro Leu Ala Glu Val Ser Trp Pro Asn Val Ser Val Pro Ala Asn
    130                 135                 140

Thr Ser His Ser Arg Thr Pro Glu Gly Leu Tyr Gln Val Thr Ser Val
145                 150                 155                 160

Leu Arg Leu Lys Pro Pro Pro Gly Arg Asn Phe Ser Cys Val Phe Trp
                165                 170                 175

Asn Thr His Val Arg Glu Leu Thr Leu Ala Ser Ile Asp Leu Gln Ser
            180                 185                 190

Gln Met Glu Pro Arg Thr His
        195


<210> 33
<211> 19
<212> PRT
<213> Homo sapiens

<400> 33
Met Ile Phe Leu Leu Leu Met Leu Ser Leu Glu Leu Gln Leu His Gln
  1               5                  10                  15

Ile Ala Ala


<210> 34
<211> 93
<212>.PRT
<213> Homo sapiens

<400> 34
Glu Leu Tyr Ile Ile Glu His Gly Ser Asn Val Thr Leu Glu Cys Asn
  1               5                  10                  15

Phe Asp Thr Gly Ser His Val Asn Leu Gly Ala Ile Thr Ala Ser Leu
            20                  25                  30

Gln Lys Val Glu Asn Asp Thr Ser Pro His Arg Glu Arg Ala Thr Leu
        35                  40                  45

Leu Glu Glu Gln Leu Pro Leu Gly Lys Ala Ser Phe His Ile Pro Gln
```

```
     50                  55                  60

Val Gln Val Arg Asp Glu Gly Gln Tyr Gln Cys Ile Ile Ile Tyr Gly
 65                  70                  75                  80

Val Ala Trp Asp Tyr Lys Tyr Leu Thr Leu Lys Val Lys
                 85                  90


<210> 35
<211> 94
<212> PRT
<213> Homo sapiens

<400> 35
Ser Tyr Arg Lys Ile Asn Thr His Ile Leu Lys Val Pro Glu Thr Asp
  1               5                  10                  15

Glu Val Glu Leu Thr Cys Gln Ala Thr Gly Tyr Pro Leu Ala Glu Val
             20                  25                  30

Ser Trp Pro Asn Val Ser Val Pro Ala Asn Thr Ser His Ser Arg Thr
         35                  40                  45

Pro Glu Gly Leu Tyr Gln Val Thr Ser Val Leu Arg Leu Lys Pro Pro
     50                  55                  60

Pro Gly Arg Asn Phe Ser Cys Val Phe Trp Asn Thr His Val Arg Glu
 65                  70                  75                  80

Leu Thr Leu Ala Ser Ile Asp Leu Gln Ser Gln Met Glu Pro
                 85                  90


<210> 36
<211> 301
<212> PRT
<213> Homo sapiens

<400> 36
Gln Trp Gln Val Phe Gly Pro Asp Lys Pro Val Gln Ala Leu Val Gly
  1               5                  10                  15

Glu Asp Ala Ala Phe Ser Cys Phe Leu Ser Pro Lys Thr Asn Ala Glu
             20                  25                  30

Ala Met Glu Val Arg Phe Phe Arg Gly Gln Phe Ser Ser Val Val His
         35                  40                  45

Leu Tyr Arg Asp Gly Lys Asp Gln Pro Phe Met Gln Met Pro Gln Tyr
     50                  55                  60

Gln Gly Arg Thr Lys Leu Val Lys Asp Ser Ile Ala Glu Gly Arg Ile
 65                  70                  75                  80

Ser Leu Arg Leu Glu Asn Ile Thr Val Leu Asp Ala Gly Leu Tyr Gly
                 85                  90                  95

Cys Arg Ile Ser Ser Gln Ser Tyr Tyr Gln Lys Ala Ile Trp Glu Leu
             100                 105                 110
```

```
Gln Val Ser Ala Leu Gly Ser Val Pro Leu Ile Ser Ile Ala Gly Tyr
        115                 120                 125

Val Asp Arg Asp Ile Gln Leu Leu Cys Gln Ser Ser Gly Trp Phe Pro
    130                 135                 140

Arg Pro Thr Ala Lys Trp Lys Gly Pro Gln Gly Gln Asp Leu Ser Thr
145                 150                 155                 160

Asp Ser Arg Thr Asn Arg Asp Met His Gly Leu Phe Asp Val Glu Ile
                165                 170                 175

Ser Leu Thr Val Gln Glu Asn Ala Gly Ser Ile Ser Cys Ser Met Arg
            180                 185                 190

His Ala His Leu Ser Arg Glu Val Glu Ser Arg Val Gln Ile Gly Asp
        195                 200                 205

Trp Arg Arg Lys His Gly Gln Ala Gly Lys Arg Lys Tyr Ser Ser Ser
    210                 215                 220

His Ile Tyr Asp Ser Phe Pro Ser Leu Ser Phe Met Asp Phe Tyr Ile
225                 230                 235                 240

Leu Arg Pro Val Gly Pro Cys Arg Ala Lys Leu Val Met Gly Thr Leu
                245                 250                 255

Lys Leu Gln Ile Leu Gly Glu Val His Phe Val Glu Lys Pro His Ser
            260                 265                 270

Leu Leu Gln Ile Ser Gly Gly Ser Thr Thr Leu Lys Lys Gly Pro Asn
        275                 280                 285

Pro Trp Ser Phe Pro Ser Pro Cys Ala Leu Phe Pro Thr
    290                 295                 300


<210> 37
<211> 17
<212> PRT
<213> Homo sapiens

<400> 37
Met Ala Leu Met Leu Ser Leu Val Leu Ser Leu Leu Lys Leu Gly Ser
  1               5                  10                  15

Gly


<210> 38
<211> 26
<212> PRT
<213> Homo sapiens

<400> 38
Thr Ala Ser Pro Trp Met Val Ser Met Thr Val Ile Leu Ala Val Phe
  1               5                  10                  15

Ile Ile Phe Met Ala Val Ser Ile Cys Cys
             20                  25
```

<210> 39
<211> 254
<212> PRT
<213> Homo sapiens

<400> 39
Met Glu Pro Ala Ala Ala Leu His Phe Ser Arg Pro Ala Ser Leu Leu
1 5 10 15

Leu Leu Leu Ser Leu Cys Ala Leu Val Ser Ala Gln Phe Thr Val Val
20 25 30

Gly Pro Ala Asn Pro Ile Leu Ala Met Val Gly Glu Asn Thr Thr Leu
35 40 45

Arg Cys His Leu Ser Pro Glu Lys Asn Ala Glu Asp Met Glu Val Arg
50 55 60

Trp Phe Arg Ser Gln Phe Ser Pro Ala Val Phe Val Tyr Lys Gly Gly
65 70 75 80

Arg Glu Arg Thr Glu Glu Gln Met Glu Glu Tyr Arg Gly Arg Ile Thr
85 90 95

Phe Val Ser Lys Asp Ile Asn Arg Gly Ser Val Ala Leu Val Ile His
100 105 110

Asn Val Thr Ala Gln Glu Asn Gly Ile Tyr Arg Cys Tyr Phe Gln Glu
115 120 125

Gly Arg Ser Tyr Asp Glu Ala Ile Leu Arg Leu Val Val Ala Gly Leu
130 135 140

Gly Ser Lys Pro Leu Ile Glu Ile Lys Ala Gln Glu Asp Gly Ser Ile
145 150 155 160

Trp Leu Glu Cys Ile Ser Gly Gly Trp Tyr Pro Glu Pro Leu Thr Val
165 170 175

Trp Arg Asp Pro Tyr Gly Glu Val Val Pro Ala Leu Lys Glu Val Ser
180 185 190

Ile Ala Asp Ala Asp Gly Leu Phe Met Val Thr Thr Ala Val Ile Ile
195 200 205

Arg Asp Lys Tyr Val Arg Asn Val Ser Cys Ser Val Asn Asn Thr Leu
210 215 220

Leu Gly Gln Glu Lys Glu Thr Val Ile Phe Ile Pro Glu Ser Phe Met
225 230 235 240

Pro Ser Ala Ser Pro Trp Met Val Ala Leu Ala Val Ile Leu
245 250

<210> 40
<211> 227
<212> PRT
<213> Homo sapiens

<400> 40
Gln Phe Thr Val Val Gly Pro Ala Asn Pro Ile Leu Ala Met Val Gly
1 5 10 15

Glu Asn Thr Thr Leu Arg Cys His Leu Ser Pro Glu Lys Asn Ala Glu
20 25 30

Asp Met Glu Val Arg Trp Phe Arg Ser Gln Phe Ser Pro Ala Val Phe
35 40 45

Val Tyr Lys Gly Gly Arg Glu Arg Thr Glu Glu Gln Met Glu Glu Tyr
50 55 60

Arg Gly Arg Ile Thr Phe Val Ser Lys Asp Ile Asn Arg Gly Ser Val
65 70 75 80

Ala Leu Val Ile His Asn Val Thr Ala Gln Glu Asn Gly Ile Tyr Arg
85 90 95

Cys Tyr Phe Gln Glu Gly Arg Ser Tyr Asp Glu Ala Ile Leu Arg Leu
100 105 110

Val Val Ala Gly Leu Gly Ser Lys Pro Leu Ile Glu Ile Lys Ala Gln
115 120 125

Glu Asp Gly Ser Ile Trp Leu Glu Cys Ile Ser Gly Gly Trp Tyr Pro
130 135 140

Glu Pro Leu Thr Val Trp Arg Asp Pro Tyr Gly Glu Val Val Pro Ala
145 150 155 160

Leu Lys Glu Val Ser Ile Ala Asp Ala Asp Gly Leu Phe Met Val Thr
165 170 175

Thr Ala Val Ile Ile Arg Asp Lys Tyr Val Arg Asn Val Ser Cys Ser
180 185 190

Val Asn Asn Thr Leu Leu Gly Gln Glu Lys Glu Thr Val Ile Phe Ile
195 200 205

Pro Glu Ser Phe Met Pro Ser Ala Ser Pro Trp Met Val Ala Leu Ala
210 215 220

Val Ile Leu
225

<210> 41
<211> 27
<212> PRT
<213> Homo sapiens

<400> 41
Met Glu Pro Ala Ala Ala Leu His Phe Ser Arg Pro Ala Ser Leu Leu
1 5 10 15

Leu Leu Leu Ser Leu Cys Ala Leu Val Ser Ala
20 25

<210> 42
<211> 20
<212> PRT
<213> Homo sapiens

<400> 42
Gly Pro Thr Gly Ala Arg Leu Thr Leu Val Leu Ala Leu Thr Val Ile
1 5 10 15

Leu Glu Leu Thr
20

<210> 43
<211> 394
<212> PRT
<213> Homo sapiens

<400> 43
Met Arg Glu Ile Val Trp Tyr Arg Val Thr Asp Gly Gly Thr Ile Lys
1 5 10 15

Gln Lys Ile Phe Thr Phe Asp Ala Met Phe Ser Thr Asn Tyr Ser His
20 25 30

Met Glu Asn Tyr Arg Lys Arg Glu Asp Leu Val Tyr Gln Ser Thr Val
35 40 45

Arg Leu Pro Glu Val Arg Ile Ser Asp Asn Gly Pro Tyr Glu Cys His
50 55 60

Val Gly Ile Tyr Asp Arg Ala Thr Arg Glu Lys Val Val Leu Ala Ser
65 70 75 80

Gly Asn Ile Phe Leu Asn Val Met Ala Pro Pro Thr Ser Ile Glu Val
85 90 95

Val Ala Ala Asp Thr Pro Ala Pro Phe Ser Arg Tyr Gln Ala Gln Asn
100 105 110

Phe Thr Leu Val Cys Ile Val Ser Gly Gly Lys Pro Ala Pro Met Val
115 120 125

Tyr Phe Lys Arg Asp Gly Glu Pro Ile Asp Ala Val Pro Leu Ser Glu
130 135 140

Pro Pro Ala Ala Ser Ser Gly Pro Leu Gln Asp Ser Arg Pro Phe Arg
145 150 155 160

Ser Leu Leu His Arg Asp Leu Asp Asp Thr Lys Met Gln Lys Ser Leu
165 170 175

Ser Leu Leu Asp Ala Glu Asn Arg Gly Gly Arg Pro Tyr Thr Glu Arg
180 185 190

Pro Ser Arg Gly Leu Thr Pro Asp Pro Asn Ile Leu Leu Gln Pro Thr
195 200 205

Thr Glu Asn Ile Pro Glu Thr Val Val Ser Arg Glu Phe Pro Arg Trp
210 215 220

```
Val His Ser Ala Glu Pro Thr Tyr Phe Leu Arg His Ser Arg Thr Pro
225                 230                 235                 240

Ser Ser Asp Gly Thr Val Glu Val Arg Ala Leu Leu Thr Trp Thr Leu
                245                 250                 255

Asn Pro Gln Ile Asp Asn Glu Ala Leu Phe Ser Cys Glu Val Lys His
            260                 265                 270

Pro Ala Leu Ser Met Pro Met Gln Ala Glu Val Thr Leu Val Ala Pro
        275                 280                 285

Lys Gly Pro Lys Ile Val Met Thr Pro Ser Arg Ala Arg Val Gly Asp
    290                 295                 300

Thr Val Arg Ile Leu Val His Gly Phe Gln Asn Glu Val Phe Pro Glu
305                 310                 315                 320

Pro Met Phe Thr Trp Thr Arg Val Gly Ser Arg Leu Leu Asp Gly Ser
                325                 330                 335

Ala Glu Phe Asp Gly Lys Glu Leu Val Leu Glu Arg Val Pro Ala Glu
            340                 345                 350

Leu Asn Gly Ser Met Tyr Arg Cys Thr Ala Gln Asn Pro Leu Gly Ser
        355                 360                 365

Thr Asp Thr His Thr Arg Leu Ile Val Phe Glu Asn Pro Asn Ile Pro
    370                 375                 380

Arg Gly Thr Glu Asp Ser Asn Gly Ser Ile
385                 390
```

<210> 44
<211> 132
<212> PRT
<213> Homo sapiens

<400> 44

```
Gln Val Thr Val Val Gly Pro Thr Asp Pro Ile Leu Ala Met Val Gly
  1               5                  10                  15

Glu Asn Thr Thr Leu Arg Cys Cys Leu Ser Pro Glu Glu Asn Ala Glu
             20                  25                  30

Asp Met Glu Val Arg Trp Phe Gln Ser Gln Phe Ser Pro Ala Val Phe
         35                  40                  45

Val Tyr Lys Gly Gly Arg Glu Arg Thr Glu Glu Gln Lys Glu Glu Tyr
     50                  55                  60

Arg Gly Arg Thr Thr Phe Val Ser Lys Asp Ser Arg Gly Ser Val Ala
 65                  70                  75                  80

Leu Ile Ile His Asn Val Thr Ala Glu Asp Asn Gly Ile Tyr Gln Cys
                85                  90                  95

Tyr Phe Gln Glu Gly Arg Ser Cys Asn Glu Ala Ile Leu His Leu Val
            100                 105                 110
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Val Ala Asp Gln His Asn Pro Leu Ser Trp Ile Pro Ile Pro Gln Gly
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Thr Leu Ser Leu
    130


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<212> PRT
<213> Homo sapiens

<400> 45
Met Glu Pro Ala Ala Ala Leu His Phe Ser Arg Pro Ala Ser Leu Leu
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Leu Leu Leu Ser Leu Cys Ala Leu Val Ser Ala
             20                  25


<210> 46
<211> 13
<212> PRT
<213> Homo sapiens

<400> 46
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<211> 17
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Gly


<210> 48
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<212> PRT
<213> Homo sapiens

<400> 48
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Gly Gln Trp Gln Val Phe Gly Pro Asp Lys Pro Val Gln Ala Leu Val
             20                  25                  30

Gly Glu Asp Ala Ala Phe Ser Cys Phe Leu Ser Pro Lys Thr Asn Ala
        35                  40                  45

Glu Ala Met Glu Val Arg Phe Phe Arg Gly Gln Phe Ser Ser Val Val
     50                  55                  60
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His Leu Tyr Arg Asp Gly Lys Asp Gln Pro Phe Met Gln Met Pro Gln
 65                  70                  75                  80

Tyr Gln Gly Arg Thr Lys Leu Val Lys Asp Ser Ile Ala Glu Gly Arg
                 85                  90                  95

Ile Ser Leu Arg Leu Glu Asn Ile Thr Val Leu Asp Ala Gly Leu Tyr
            100                 105                 110

Gly Cys Arg Ile Ser Ser Gln Ser Tyr Tyr Gln Lys Ala Ile Trp Glu
        115                 120                 125

Leu Gln Val Ser Ala Leu Gly Ser Val Pro Leu Ile Ser Ile Thr Gly
    130                 135                 140

Tyr Val Asp Arg Asp Ile Gln Leu Leu Cys Gln Ser Ser Gly Trp Phe
145                 150                 155                 160

Pro Arg Pro Thr Ala Lys Trp Lys Gly Pro Gln Gly Gln Asp Leu Ser
                165                 170                 175

Thr Asp Ser Arg Thr Asn Arg Asp Met His Gly Leu Phe Asp Val Glu
            180                 185                 190

Ile Ser Leu Thr Val Gln Glu Asn Ala Gly Ser Ile Ser Cys Ser Met
        195                 200                 205

Arg His Ala His Leu Ser Arg Glu Val Glu Ser Arg Val Gln Ile Gly
    210                 215                 220

Asp Thr Phe Phe Glu Pro Ile Ser Trp His Leu Ala Thr Lys Val
225                 230                 235


<210> 49
<211> 222
<212> PRT
<213> Homo sapiens

<400> 49
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Glu Asp Ala Ala Phe Ser Cys Phe Leu Ser Pro Lys Thr Asn Ala Glu
             20                  25                  30

Ala Met Glu Val Arg Phe Phe Arg Gly Gln Phe Ser Ser Val Val His
         35                  40                  45

Leu Tyr Arg Asp Gly Lys Asp Gln Pro Phe Met Gln Met Pro Gln Tyr
     50                  55                  60

Gln Gly Arg Thr Lys Leu Val Lys Asp Ser Ile Ala Glu Gly Arg Ile
 65                  70                  75                  80

Ser Leu Arg Leu Glu Asn Ile Thr Val Leu Asp Ala Gly Leu Tyr Gly
                 85                  90                  95

Cys Arg Ile Ser Ser Gln Ser Tyr Tyr Gln Lys Ala Ile Trp Glu Leu
            100                 105                 110
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Gln Val Ser Ala Leu Gly Ser Val Pro Leu Ile Ser Ile Thr Gly Tyr
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Val Asp Arg Asp Ile Gln Leu Leu Cys Gln Ser Ser Gly Trp Phe Pro
    130                 135                 140

Arg Pro Thr Ala Lys Trp Lys Gly Pro Gln Gly Gln Asp Leu Ser Thr
145                 150                 155                 160

Asp Ser Arg Thr Asn Arg Asp Met His Gly Leu Phe Asp Val Glu Ile
                165                 170                 175

Ser Leu Thr Val Gln Glu Asn Ala Gly Ser Ile Ser Cys Ser Met Arg
            180                 185                 190

His Ala His Leu Ser Arg Glu Val Glu Ser Arg Val Gln Ile Gly Asp
        195                 200                 205

Thr Phe Phe Glu Pro Ile Ser Trp His Leu Ala Thr Lys Val
    210                 215                 220
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INDICATIONS RELATING TO A DEPOSITED MICROORGANISM OR OTHER BIOLOGICAL MATERIAL

(PCT Rule 13*bis*)

A. The indications made below relate to the deposited microorganism or other biological material referred to in the description at Page 115, Table 1.

B. IDENTIFICATION OF DEPOSIT Further deposits are identified on an additional sheet ☐

Name of depositary institution: American Type Culture Collection

Address of depositary institution *(including postal code and country)*
10801 University Boulevard
Manassas, Virginia 20110-2209
United States of America

Date of deposit	Accession Number
August 7, 2000	PTA-2332

C. ADDITIONAL INDICATIONS *(leave blank if not applicable)* This information is continued on an additional sheet ☐

D. DESIGNATED STATES FOR WHICH INDICATIONS ARE MADE *(if the indications are not for all designated States)*

Europe
In respect of those designations in which a European Patent is sought a sample of the deposited microorganism will be made available until the publication of the mention of the grant of the European patent or until the date on which the application has been refused or withdrawn or is deemed to be withdrawn, only by the issue of such a sample to an expert nominated by the person requesting the sample (Rule 28(4) EPC). Continued on additional sheets

E. SEPARATE FURNISHING OF INDICATIONS *(leave blank if not applicable)*

The indications listed below will be submitted to the international Bureau later *(specify the general nature of the indications e.g., "Accession Number of Deposit")*

For receiving Office use only	For International Bureau use only
☒ This sheet was received with the international application	☐ This sheet was received by the International Bureau on:
Authorized officer Vanessa E. Clark	Authorized officer

ATCC Deposit No. PTA-2332

CANADA

The applicant requests that, until either a Canadian patent has been issued on the basis of an application or the application has been refused, or is abandoned and no longer subject to reinstatement, or is withdrawn, the Commissioner of Patents only authorizes the furnishing of a sample of the deposited biological material referred to in the application to an independent expert nominated by the Commissioner, the applicant must, by a written statement, inform the International Bureau accordingly before completion of technical preparations for publication of the international application.

NORWAY

The applicant hereby requests that the application has been laid open to public inspection (by the Norwegian Patent Office), or has been finally decided upon by the Norwegian Patent Office without having been laid open inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Norwegian Patent Office not later than at the time when the application is made available to the public under Sections 22 and 33(3) of the Norwegian Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on the list of recognized experts drawn up by the Norwegian Patent Office or any person approved by the applicant in the individual case.

AUSTRALIA

The applicant hereby gives notice that the furnishing of a sample of a microorganism shall only be effected prior to the grant of a patent, or prior to the lapsing, refusal or withdrawal of the application, to a person who is a skilled addressee without an interest in the invention (Regulation 3.25(3) of the Australian Patents Regulations).

FINLAND

The applicant hereby requests that, until the application has been laid open to public inspection (by the National Board of Patents and Regulations), or has been finally decided upon by the National Board of Patents and Registration without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art.

ATCC Deposit No. PTA-2332

UNITED KINGDOM

The applicant hereby requests that the furnishing of a sample of a microorganism shall only be made available to an expert. The request to this effect must be filed by the applicant with the International Bureau before the completion of the technical preparations for the international publication of the application.

DENMARK

The applicant hereby requests that, until the application has been laid open to public inspection (by the Danish Patent Office), or has been finally decided upon by the Danish Patent office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the Danish Patent Office not later that at the time when the application is made available to the public under Sections 22 and 33(3) of the Danish Patents Act. If such a request has been filed by the applicant, any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Danish Patent Office or any person by the applicant in the individual case.

SWEDEN

The applicant hereby requests that, until the application has been laid open to public inspection (by the Swedish Patent Office), or has been finally decided upon by the Swedish Patent Office without having been laid open to public inspection, the furnishing of a sample shall only be effected to an expert in the art. The request to this effect shall be filed by the applicant with the International Bureau before the expiration of 16 months from the priority date (preferably on the Form PCT/RO/134 reproduced in annex Z of Volume I of the PCT Applicant's Guide). If such a request has been filed by the applicant any request made by a third party for the furnishing of a sample shall indicate the expert to be used. That expert may be any person entered on a list of recognized experts drawn up by the Swedish Patent Office or any person approved by a applicant in the individual case.

NETHERLANDS

The applicant hereby requests that until the date of a grant of a Netherlands patent or until the date on which the application is refused or withdrawn or lapsed, the microorganism shall be made available as provided in the 31F(1) of the Patent Rules only by the issue of a sample to an expert. The request to this effect must be furnished by the applicant with the Netherlands Industrial Property Office before the date on which the application is made available to the public under Section 22C or Section 25 of the Patents Act of the Kingdom of the Netherlands, whichever of the two dates occurs earlier.